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FORTIETH
ANNUAL REGISTER

OF THE

Rensselaer Polytechnic Institute,

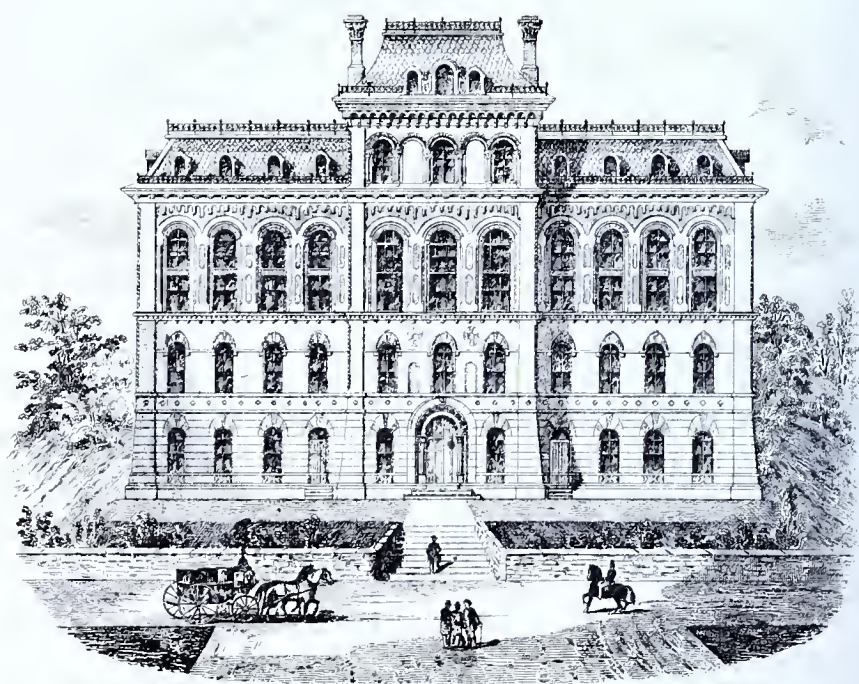
TROY, N. Y.,

FOR THE ACADEMICAL YEAR,

1863-64.

JULY, 1864.

YOUNG & BENSON, TROY, N. Y.



RENSSELAER POLYTECHNIC INSTITUTE.
TROY, N.Y.

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Establishment of the Institute.

THE RENSSELAER POLYTECHNIC INSTITUTE was founded in 1824, by the late Hon. STEPHEN VAN RENSSELAER, as a *School of Theoretical and Practical Science*. In 1826 it received from the Legislature of the State of New York its act of incorporation, with those chartered authorities and privileges usually granted to the higher Educational Institutions of this State.

In 1849 the Institute was re-organized upon the basis of a general Polytechnic Institute. Among the changes then introduced, were a material enlargement of its course of study, and a proportionate increase of the time allotted to it, and a more elevated standard of requirements for the admission of candidates to the Honors of Graduation.

Since its foundation, the Institute has sent forth a considerable number of Graduates, who—as Professors and Teachers of the Mathematical and Physical Sciences, as Practical Chemists and Geologists, and as Engineers in the various departments of Constructive and Topographical Art—have contributed to the increase and diffusion of Science, as well as to its applications to the business pursuits of life, with a success, to which, it is believed, the Institute may refer with becoming confidence and just pride.

Board of Trustees.

REV. N. S. S. BEMAN, D. D., LL. D., PRESIDENT.

WILLIAM P. VAN RENSSELAER, VICE PRESIDENT.

THOMAS C. BRINSMADE, M. D.,
JOHN B. TIBBITS, } PRUDENTIAL COMMITTEE.

WILLIAM GURLEY, SECRETARY.

WILLIAM H. YOUNG, TREASURER.

HON. ISAAC McCONIHE, LL. D. REV. ALVA T. TWING.

HON. JOSEPH M. WARREN. D. THOMAS VAIL.

BENJAMIN P. JOHNSON. A. VAN RENSSELAER, M. D.

T. W. BLATCHFORD, M. D. HON. JONATHAN EDWARDS.

JONATHAN E. WHIPPLE. JOHN F. WINSLOW.

E. THOMPSON GALE. HON. JOHN A. GRISWOLD.

HON. LYMAN WILDER. ALBERT E. POWERS.

REV. DUNCAN KENNEDY, D. D. HON. JONAS C. HEARTT.

HON. GEORGE GOULD.

HON. JAMES THORN, M. D., *Mayor of Troy, Ex-Officio.*

Faculty.

REV. NATHAN S. S. BEMAN, D. D., LL. D., PRESIDENT.
Professor of Mental Philosophy.

CHARLES DROWNE, C. E., A. M., DIRECTOR.
Professor of Theoretical and Practical Mechanics.

JAMES HALL, LL. D., N. Y. STATE PALÆONTOLOGIST.
Professor of Theoretical, Practical and Mining Geology.

DASCOM GREENE, C. E.
Professor of Mathematics and Astronomy.

S. EDWARD WARREN, C. E.
Professor of Descriptive Geometry and Geometrical Drawing.

HENRY B. NASON, PH. D.
Professor of Natural History.

WILLIAM H. SEARLES, C. E.
Professor of Geodesy and Topographical Drawing.

Professor of Chemistry and Physics.

PHILIP H. BAERMANN.
Professor of Modern Languages.

Professor of the English Language and Literature.

WILLIAM FENTON, C. E.
Instructor in Mathematics and Geodesy.

HORACE LOOMIS.
Instructor in Mathematics and English Composition.

LLOYD HARPER, Janitor.

Register of Students.

DIVISION A.—FIRST CLASS.—1863-64.

NAMES.	RESIDENCES.	ROOMS.
PETER H. FOX,	<i>Harrisburgh, Pa.,</i>	17 King-St.
RALPH G. PACKARD,	<i>Niagara Falls, N. Y.,</i>	17 King-St.
JOSÉ R. DA S. PIRAJÁ, JR.,	<i>Bahia, Brazil,</i>	31 Fourth-St.
ROBERT VAN BUREN,	<i>New York City,</i>	65 Fourth-St.
CHRISTOPHER C. WAITE,	<i>Toledo, O.,</i>	17 Fulton-St.
DRAKE WHITNEY,	<i>Niagara Falls, N. Y.,</i>	102 Second-St.
HENRY W. WILSON,	<i>Altoona, Pa.,</i>	65 Fourth-St.

DIVISION B.—SECOND CLASS.—1863-64.

NAMES.	RESIDENCES.	ROOMS.
GEORGE B. BRAINERD,	<i>Brooklyn, N. Y.,</i>	17 Fulton-St.
SAMUEL BUEL, JR.,	<i>Poughkeepsie, N. Y.,</i>	17 Fulton-St.
CLIFFORD BUXTON,	<i>Warren, Me.,</i>	17 King-St.
THOMAS M. CLEEMANN, A.B.,	<i>Philadelphia, Pa.,</i>	17 King-St.
CHARLES C. CRAFT,	<i>Pittsburgh, Pa.,</i>	53 Fourth-St.
HENRY H. FARNUM, JR.,	<i>Port Jervis, N. Y.,</i>	17 Fulton-St.
JOHN W. GRISWOLD,	<i>Erie, Pa.,</i>	135 Third-St.
HORACE LOOMIS,	<i>Binghamton, N. Y.,</i>	135 Third-St.
MARSHALL H. MALLORY,	<i>Watertown, Conn.,</i>	3 St. Paul's Place.
THOMAS C. RAYMOND,	<i>Westborough, Mass.,</i>	17 Fulton-St.
JOHN C. THOMPSON,	<i>Cincinnati, O.,</i>	102 Second-St.
ALFRED T. WHITE,	<i>Brooklyn, N. Y.,</i>	30 Second-St.

DIVISION C.—THIRD CLASS.—1863-64.

NAMES.	RESIDENCES.	ROOMS.
ALEXANDER ADDISON,	<i>Troy, N. Y.,</i>	3 Waverly Place.
EDWARD L. ARCHER,	<i>Brooklyn, N. Y.,</i>	30 Second-St.
SATTERLEE ARNOLD,	<i>Sand Lake, N. Y.,</i>	17 Fulton-St.
JULIUS N. BEEMER,	<i>Newton, N. J.,</i>	17 Fulton-St.
JAMES E. BETTNER,	<i>Yonkers, N. Y.,</i>	43 Second-St.
CHARLES E. BURRALL,	<i>Rock Island, Ill.,</i>	28 Ferry-St.
WALTER C. CHILDS,	<i>Pittsburgh, Pa.,</i>	17 Grand Div-St.
WILLIAM H. COUGHLIN,	<i>Alexandria, Va.,</i>	102 Second-St.
CHARLES DAVISON,	<i>New York City,</i>	58 Fifth-St.
THEODORE N. ELY,	<i>Watertown, N. Y.,</i>	106 Second-St.
HERBERT C. FELTON,	<i>Troy, N. Y.,</i>	120 Second-St.
SAMUEL J. FIELDS,	<i>Buffalo, N. Y.,</i>	129 Fifth-St.
JOHN Q. A. FORD,	<i>Kennebunk, Me.,</i>	106 Second-St.
CHARLES B. GERARD,	<i>Newburgh, N. Y.,</i>	61 Grand Div-St.
WILLIAM P. HARRIS,	<i>Brooklyn, N. Y.,</i>	58 Fifth-St.
CHARLES R. HICKS,	<i>Troy, N. Y.,</i>	195 Second-St.
THOMAS L. KNAP,	<i>Ogdensburgh, N. Y.,</i>	17 Grand Div-St.
BENJAMIN N. LILIENTHAL,	<i>New York City,</i>	23 Ferry-St.
JOHN F. MARSH,	<i>Brooklyn, N. Y.,</i>	172 Third-St.
JAMES T. MUNN,	<i>New York City,</i>	31 Fourth-St.
CHARLES W. MUSGRAVE,	<i>Bay Ridge, N. Y.,</i>	102 Second-St.
JULIEN S. OGDEN,	<i>New York City,</i>	53 Fourth-St.
GEORGE F. OLIVER,	<i>Troy, N. Y.,</i>	328 Twelfth-St.
CHARLES P. PERKINS, A. B.,	<i>Philadelphia, Pa.,</i>	102 Second-St.
JOSEPH C. PLATT, JR.,	<i>Scranton, Pa.,</i>	102 Second-St.
CHARLES W. RAE,	<i>Champlain, N. Y.,</i>	92 Fourth-St.
JOHN S. SHAFER,	<i>Stillwater, N. J.,</i>	17 Fulton-St.
HOLLAND N. STEVENSON,	<i>Cambridge, N. Y.,</i>	31 Fourth-St.
FRANK N. TREVOR,	<i>Lockport, N. Y.,</i>	129 Fifth-St.
CHARLES UNDERHILL, A. B.,	<i>Sing Sing, N. Y.,</i>	17 King-St.
EUGENE VANDERPOOL,	<i>Newark, N. J.,</i>	17 King-St.

DIVISION D.—FOURTH CLASS.—1863-64.

NAMES.	RESIDENCES.	ROOMS.
WHITFIELD B. ABBOTT,	<i>Fort Lee, N. J.,</i>	122 Third-St.
STEPHEN W. BARKER,	<i>White Creek, N. Y.,</i>	109 Fifth-St.
ARTHUR BEARDSLEY,	<i>Poughkeepsie, N. Y.,</i>	111 Fifth-St.
PABLO T. CANTERO,	<i>Trinidad, Cuba,</i>	17 Fulton-St.
GIDEON W. CARMICHAEL,	<i>Sand Lake, N. Y.,</i>	116 Fifth-St.
ROBERT S. CHURCH,	<i>Brooklyn, N. Y.,</i>	102 Second-St.
WALTER E. COX,	<i>Bethlehem, Pa.,</i>	43 Second-St.
L. HUNTLEY CRAMER,	<i>Saratoga Springs, N. Y.,</i>	Waterford.
B. DALTON DORR,	<i>Philadelphia, Pa.,</i>	30 Second-St.
AUGUSTUS H. EATON,	<i>Brunswick, N. Y.,</i>	Brunswick.
FRANCIS W. ELSTON,	<i>Crawfordsville, Ind.,</i>	7 Ida Terrace.
JOSÉ ESCOBAR,	<i>Trinidad, Cuba,</i>	31 Fourth-St.
ALFRED DE F. GALE,	<i>Troy, N. Y.,</i>	59 First-St.
EDWARD M. GREEN,	<i>Troy, N. Y.,</i>	32 First-St.
NELSON J. HARRIS,	<i>Hamilton, N. Y.,</i>	Albany.
JOSÉ HERNANDEZ,	<i>Havana, Cuba,</i>	55 Fourth-St.
ALFRED W. HIGGINS,	<i>Buffalo, N. Y.,</i>	Albany.
CHARLES P. HOWELL,	<i>Goshen, N. Y.,</i>	23 Ferry-St.
H. REEVE INGALLS,	<i>Troy, N. Y.,</i>	Sunny Side.
AMASA C. JACKSON,	<i>New York City,</i>	61 Grand Div-St.
GEORGE M. KING,	<i>Morristown, N. J.,</i>	7 Ida Terrace.
J. HAMILTON LANGWORTHY,	<i>Stonington, Conn.,</i>	101 Third-St.
GEORGE B. MALLORY,	<i>Mystic, Conn.,</i>	65 Fourth-St.
FRANK L. MOORE,	<i>New York City,</i>	101 Third-St.
EDWARD H. MORRISON,	<i>Newark, N. J.,</i>	17 Fulton-St.
ROBERT A. PACKER,	<i>Mauch Chunk, Pa.,</i>	43 Second-St.
JUAN PEREZ,	<i>Consolacion, Cuba,</i>	55 Fourth-St.
C. VALLETTE PETTIBONE,	<i>Appleton, Wis.,</i>	18 Ferry-St.
JOSÉ PONCE,	<i>Trinidad, Cuba,</i>	104 Third-St.
JOHN SALTAR, JR.,	<i>Pemberton, N. J.,</i>	126 Ferry-St.
GEORGE V. SHEPARD,	<i>Troy, N. Y.,</i>	208 Third-St.

MILO A. SMITH,	<i>Detroit, Mich.,</i>	101 Third-St.
ORISON B. SMITH,	<i>Ravenswood, N. Y.,</i>	109 Fifth-St.
CHARLES L. SNOW,	<i>Brooklyn, N. Y.,</i>	80 First-St.
N. HENRY STARBUCK,	<i>Troy, N. Y.,</i>	54 Fourth-St.
WILLIAM B. STILSON,	<i>New Milford, Conn.,</i>	122 Third-St.
DAVID H. VALENTINE,	<i>Green Point, N. Y.,</i>	101 Third-St.
WILLIAM A. VANDERVOORT,	<i>New York City,</i>	65 Fourth-St.
FRANK WARREN,	<i>Louisville, Ky.,</i>	61 Grand Div-St.
WILLIAM WATERS,	<i>Franklin, N. Y.,</i>	36 Ferry-St.

FREDERIC A. APELLES,	<i>West Point, N. Y.,</i>	101 Third-St.
JUSTO M. DEL CAÑAL,	<i>Pinar del Rio, Cuba,</i>	55 Fourth-St.
WILLIAM G. COCHRANE,	<i>New York City,</i>	8 Fifth-St.
GUILLERMO P. GONZALEZ,	<i>Havana, Cuba,</i>	55 Fourth-St.
J. ROSS JACKSON,	<i>Paterson, N. J.,</i>	107 Second-St.
WILLIAM KNIGHT,	<i>Yonkers, N. Y.,</i>	107 Second-St.

Summary.

DIVISION A,	-	-	-	-	-	-	-	-	-	7
DIVISION B,	-	-	-	-	-	-	-	-	-	12
DIVISION C,	-	-	-	-	-	-	-	-	-	31
DIVISION D,	-	-	-	-	-	-	-	-	-	46
TOTAL,	-	-	-	-	-	-	-	-	-	96

Graduates on the 29th June, 1864.

PETER H. FOX, C. E.,	-	-	-	-	<i>Harrisburgh, Pa.</i>
RALPH G. PACKARD, C. E.,	-	-	-	-	<i>Niagara Falls, N. Y.</i>
ROBERT VAN BUREN, C. E.,	-	-	-	-	<i>New York City.</i>
CHRISTOPHER C. WAITE, C. E.,	-	-	-	-	<i>Toledo, O.</i>
DRAKE WHITNEY, C. E.,	-	-	-	-	<i>Niagara Falls, N. Y.</i>
HENRY W. WILSON, C. E.,	-	-	-	-	<i>Altoona, Pa.</i>

Graduating Theses.

- 1.—REVIEW of the WROUGHT IRON PLATE GIRDER BRIDGE over the
Erie Canal, on the New York Central Railroad, at Newark
Station, N. Y., - - - - - *Mr. Fox.*
- 2.—REVIEW of a CORLISS HIGH PRESSURE ENGINE, - *Mr. Packard.*
- 3.—REVIEW of the DRAW BRIDGE over the Illinois River, on the Quincy
and Toledo Railroad, at Meredosia, Ill., - *Mr. Van Buren.*
- 4.—REVIEW of the LOCOMOTIVE ENGINE "Talisman," - *Mr. Waite.*
- 5.—REVIEW of McCALLUM'S INFLEXIBLE ARCH TRUSS BRIDGE,
Mr. Whitney.
- 6.—REVIEW of the IRON GIRDER BRIDGE over the Schuylkill River, on
the Delaware Extension of the Pennsylvania Central Railroad,
at Philadelphia, Pa., - - - - - *Mr. Wilson.*

Objects of the Institute.

THE RENSSELAER POLYTECHNIC INSTITUTE has for its primary object, the scientific and professional education of Chemists, Naturalists, Physicists, Architects, and Civil, Mechanical and Topographical Engineers; and for a secondary object, the scientific training of all others, who, not contemplating a future professional career, are desirous to avail themselves of its instruction and discipline.

Organization.

For the accomplishment of the objects indicated above, the following COURSES OF STUDY have been established:—

- 1.—COURSE IN CIVIL ENGINEERING.
- 2.—COURSE IN MECHANICAL ENGINEERING.
- 3.—COURSE IN TOPOGRAPHICAL ENGINEERING.
- 4.—COURSE IN NATURAL SCIENCE.*

The studies in each of these Courses extend over a period of four years, requiring a succession of as many Annual Classes, which, in the order of Seniority, are respectively designated *Divisions A, B, C, and D*, the latter being the matriculating or entering class.

These Courses rest upon the same basis of preparatory culture; and are, moreover, identical during the first two years, making the requirements for admission to *Division D, C, or B*, the same, whichever course may be taken.

* It is the intention of the Trustees to establish a COURSE IN MINING ENGINEERING, at the Institute, which shall be both *Comprehensive and Practical*, and especially adapted to meet the wants of those young gentlemen, who, having completed the COURSE IN NATURAL SCIENCE, are desirous to make this important branch of Engineering a *Specialty*.

Calendar.

1864-65.

1864.

SEPT. 14.—	Winter Session begins	- - - -	Wednesday.
SEPT. 14.—	} Examination of Candidates for admission	{	Wednesday.
SEPT. 15.—			Thursday.
SEPT. 17.—			Saturday.
SEPT. 16.—	Lectures and Recitations begin	- - - -	Friday.
NOV. —	Thanksgiving Recess of one day	- - - -	Thursday.
DEC. 23.—	Christmas Recess begins	- - - -	Friday.

1865.

JAN. 3.—	Christmas Recess ends	- - - -	Tuesday.
JAN. 30.—	Winter Examination begins	- - - -	Monday.
FEB. 7.—	Winter Examination ends	- - - -	Tuesday.
FEB. 7.—	Winter Session ends	- - - -	Tuesday.

WINTER VACATION OF ONE WEEK.

FEB. 15.—	Summer Session begins	- - - -	Wednesday.
FEB. 15.—	} Examination of Candidates for admission	{	Wednesday.
FEB. 16.—			Thursday.
FEB. 17.—	Lectures and Recitations begin	- - - -	Friday.
FEB. 22.—	Recess of one day	- - - -	Wednesday.
JUNE 26.—	Summer Examination begins	- - - -	Monday.
JULY 4.—	Recess of one day	- - - -	Tuesday.
JULY 5.—	Summer Examination ends	- - - -	Wednesday.
JULY 6.—	Anniversary Exercises and Conferring Degrees	- - - -	Thursday.
JULY 6.—	Summer Session ends	- - - -	Thursday.

SUMMER VACATION OF TEN WEEKS.

1865-66.

1865.

SEPT. 13.—	Winter Session begins	- - - -	Wednesday.
SEPT. 13.—	} Examination of Candidates for admission	{	Wednesday.
SEPT. 14.—			Thursday.
SEPT. 16.—			Saturday.
SEPT. 15.—	Lectures and Recitations begin	- - - -	Friday.

Terms of Admission.

Candidates for admission to Division D, at the opening of the Winter Session, are examined in Reading, Spelling, Penmanship, Geography, Arithmetic, English Grammar and Elementary Algebra. Candidates for admission to advanced standing, at the opening of either the Winter or Summer Session, are examined in the same, and also in all the previous studies of the Division which they propose to enter.

Graduates of Colleges are admitted to full standing in Division C, at the opening of the Winter Session, upon the evidence furnished by the exhibition of their diplomas, without further examination.

Students are received at any time after the opening of either Semi-Annual Session, if they are found suitably prepared to join an existing class; and in such cases are admitted to conditional standing, with the privilege of removing their conditions at the close of the Session.

For admission to Division D, at the opening of the Winter Session, the candidate must be at least 16 years of age; and for admission to advanced standing, he must be correspondingly older.

Previously to examination, the candidate must present testimonials of good moral character to the Director of the Institute.

Young gentlemen desiring to attend the exercises of particular departments, without becoming candidates for Degrees, are allowed to do so, provided they have the requisite preparation for the study of the subjects selected.

Curriculum.

The following Schedule presents a systematic view of the studies of the Institute, without regard to their distribution in the different Courses.

The leading titles, preceded by Roman numerals, are names of Departments of Instruction; the subordinate titles, preceded by Italic letters, are names of Sub-Departments; and the titles in Italic, preceded by Arabic numerals, are names of Subjects of Study.

I. MATHEMATICS.

- | | |
|-------------------------------------|-------------------------------------|
| <i>a.</i> —Algebra. | <i>b.</i> —Geometry. |
| <i>c.</i> —Analytical Trigonometry. | <i>d.</i> —Analytical Geometry. |
| <i>e.</i> —Differential Calculus. | <i>f.</i> —Integral Calculus. |
| <i>g.</i> —Calculus of Variations. | <i>h.</i> —Method of Least Squares. |

II. RATIONAL MECHANICS.

- | | |
|---------------------------------|---------------------------------|
| <i>a.</i> —Mechanics of Solids. | <i>b.</i> —Mechanics of Fluids. |
|---------------------------------|---------------------------------|

III. PHYSICS.

- | | |
|----------------------------------|-------------------------|
| <i>a.</i> —Introductory Physics. | |
| <i>b.</i> —Acoustics. | <i>c.</i> —Optics. |
| <i>d.</i> —Heat. | <i>e.</i> —Electricity. |

IV. ASTRONOMY.

- | | |
|-----------------------------------|---------------------------------|
| <i>a.</i> —Descriptive Astronomy. | <i>b.</i> —Spherical Astronomy. |
| <i>c.</i> —Practical Astronomy. | |

V. CHEMISTRY.

- | | |
|--|-----------------------------------|
| <i>a.</i> —Inorganic Chemistry. | <i>b.</i> —Organic Chemistry. |
| <i>c.</i> —Practical Chemistry. | |
| 1.— <i>Qualitative Analysis.</i> | 2.— <i>Blowpipe Analysis.</i> |
| 3.— <i>Determinative Mineralogy.</i> | 4.— <i>Quantitative Analysis.</i> |
| <i>d.</i> —Technical Chemistry. | |
| 1.— <i>Chemistry of the Materials and Processes of Heating and Illumination.</i> | |
| 2.— <i>Chemistry of the Materials used in Construction.</i> | |

VI. NATURAL HISTORY.

- | | |
|-------------------------|------------------------|
| a.—Botany. | b.—Zoölogy. |
| c.—Mineralogy. | d.—Palæontology. |
| e.—Descriptive Geology. | f.—Physical Geography. |

VII. GEOLOGY.

- | | |
|---|-----------------------|
| a.—Theoretical Geology. | b.—Practical Geology. |
| c.—Technical Geology. | |
| 1.— <i>Geology of Materials used in Construction.</i> | |
| 2.— <i>Geology of Mining.</i> | |

VIII. GEODESY.

- | | |
|---------------------------------------|------------------------------|
| a.—Adjustment and Use of Instruments. | |
| b.—Line Surveying. | c.—Practical Trigonometry. |
| d.—Topographical Surveying. | e.—Hydrographical Surveying. |
| f.—Road Engineering. | g.—Higher Geodesy. |

IX. DESCRIPTIVE GEOMETRY.

- | | | |
|-------------------------------|---------------------------------------|-------------------------------------|
| a.—Planc Problems. | | |
| b.—Elementary Projections. | | |
| 1.— <i>Solids.</i> | 2.— <i>Shadows.</i> | 3.— <i>Isometrical Projections.</i> |
| c.—Orthographic Projections. | | |
| 1.— <i>General Problems.</i> | 2.— <i>Topographical Projections.</i> | |
| d.—Shades and Shadows. | | |
| 1.— <i>General Problems.</i> | 2.— <i>Gnomonics.</i> | |
| e.—Linear Perspective. | | |
| 1.— <i>General Problems.</i> | 2.— <i>Spherical Projections.</i> | |
| f.—Problems in Stone Cutting. | | |

X. PHYSICAL MECHANICS.

- | | |
|----------------------------------|-----------------------------------|
| a.—Mechanics of Solids. | |
| 1.— <i>Friction.</i> | 2.— <i>Strength of Materials.</i> |
| b.—Mechanics of Fluids. | |
| 1.— <i>Practical Hydraulics.</i> | 2.— <i>Practical Pneumatics.</i> |

XI. CONSTRUCTIONS.

- | |
|--|
| a.—Stability of Structures. |
| b.—Construction of Architectural and Engineering Works. |
| c.—Designs and Estimates for, and Reviews of Special Architectural and Engineering Structures. |

XII. MACHINES.

- a.*—Cinematics.
- b.*—Theory of Machines.
- c.*—Prime Movers.
- 1.—*Hydraulic Motors.*
- 2.—*Steam Engines.*
- 3.—*Air Engines.*
- 4.—*Electro-Magnetic Motors.*
- d.*—Construction of Machines.
- e.*—Location of Machines.
- f.*—Designs and Estimates for, and reviews of Special Machines.

XIII. GEOMETRICAL DRAWING.

- a.*—Problems in Descriptive Geometry.
- 1.—*Plane Problems.*
- 2.—*Elementary Projections.*
- 3.—*Orthographic Projections.*
- 4.—*Shades and Shadows.*
- 5.—*Perspective.*
- 6.—*Stone Cutting.*
- b.*—Construction Drawing.
- 1.—*Elements of Drawing.*
- 2.—*Elements of Structures.*
- 3.—*Bridge Drawing.*
- c.*—Machine Drawing.
- 1.—*Elements of Machines.*
- 2.—*Complete Machines.*

XIV. TOPOGRAPHICAL DRAWING.

- a.*—Elementary Drawing.
- b.*—Topographical Plans.
- c.*—Maps of Line Surveys.
- d.*—Colored Topography.
- e.*—Maps of Topographical and Hydrographical Surveys.
- f.*—Plans, Profiles and Sections of Railway Surveys.

XV. ENGLISH LANGUAGE AND LITERATURE.

- a.*—English Composition.
- b.*—Elocution.
- c.*—Rhetoric.
- d.*—Logic.

XVI. FRENCH LANGUAGE.

- a.*—French Grammar.
- b.*—English Translations.
- c.*—French Composition.
- d.*—French Literature.

XVII. PHILOSOPHY.

- a.*—History of Philosophy.
- b.*—Intellectual Philosophy.
- c.*—Ethical Philosophy.

Courses of Study.

The following *Programmes* of the several Courses of Study, set forth the manner in which the different studies of the courses are respectively distributed for each year and for each semi-annual session. The departments, sub-departments and subjects are put in a form to admit of direct reference to the general curriculum, given on the preceding pages.

I. COURSE IN CIVIL ENGINEERING.

The studies of the first three years of the Course in Civil Engineering, have for their object the establishment of a broad and substantial basis of disciplinary culture—literary, scientific and artistic. The studies of the fourth year are essentially practical and technical.

The studies of this course are designed to secure to all who have duly complied with the various requirements,—in other words, to its *Graduates*—a professional preparation, at once thorough and practical, for the following specialties of Engineering practice :—

The location, construction and superintendence of Public Works, as Railways, Canals, Water Works, etc.; the design, construction and management of Mills, Iron Works, Chemical Works and Pneumatic Works; the design and construction of Girder Bridges, Suspension Bridges and Arch Bridges; the construction and use of Hydraulic Motors, Wind Motors and Steam Engines; the survey of Rivers, Lakes and Harbors, and the direction of their Improvements; the determination of Latitude, Longitude, Time and the Meridian in Geographical explorations, or for other purposes; the construction of the various kinds of Geometrical and Topographical Drawings.

The Graduates in this Course are admitted to the degree of CIVIL ENGINEER.

II. COURSE IN MECHANICAL ENGINEERING.

The studies of the Course in Mechanical Engineering are identical with those in Civil Engineering for the first two years; and differ from the latter in the last two years, by including special extensions of Machines, Machine Drawing and Prime Movers, but less of Geodesy, Constructions and Topographical Drawing.

The studies of this Course are designed to secure to its *Graduates* a suitable preparation for the following specialties of professional practice :—

The design, construction and use of the various kinds of Hydraulic Motors; the design, construction and use of the various kinds of Steam Engines; the design, construction and use of Wind Motors and Air Engines; the design, construction and use of Machines in general, and the determination of their efficiency; the construction of the various kinds of Machine Drawings.

The Graduates in this Course are admitted to the degree of MECHANICAL ENGINEER.

III. COURSE IN TOPOGRAPHICAL ENGINEERING.

The studies of the Course in Topographical Engineering are also identical with those in Civil Engineering for the first two years; but for the last two years they include special extensions of Astronomy, Geodesy, Descriptive Geometry and Topographical Drawing, and less of Machines, Constructions and Machine Drawing.

The studies of this Course are designed to secure to its *Graduates* a suitable preparation for the following specialties of professional practice :—

The trigonometrical and topographical survey of States, Counties and Smaller Tracts; the survey of Rivers, Lakes, Harbors, etc., and the direction of their Improvements; the location of Stations by the methods of Practical Astronomy and Higher Geodesy; the survey of State Boundaries and the Coast of the United States; the construction of the various kinds of Geometrical and Topographical Drawings.

The Graduates in this Course are admitted to the degree of TOPOGRAPHICAL ENGINEER.

IV. COURSE IN NATURAL SCIENCE.

As in the two preceding Courses, the studies of the Course in Natural Science are identical with those in Civil Engineering for the first two years. The studies of the last two years, however, embrace more subjects of Natural History, Chemistry and Geology, and less of the Higher Mathematics.

This Course is designed to secure to its *Graduates* a suitable preparation for the study of Mining Engineering, or for the following specialties of professional practice :—

The chemical analysis of Soils, Ores, other Minerals and Organic Bodies; the construction and management of Bleach Works, Glass Works, Iron Works, Pneumatic Works, Salt Works, etc.; the selection and test of Materials used in Construction; the direction of Geological Surveys.

The Graduates in this Course are admitted to the degree of BACHELOR OF SCIENCE.

Course in Civil Engineering.

FOUR YEARS.

Departments of Instruction.		Subjects of Study.
DIVISION D.		
Winter Session.	MATHEMATICS,	Davies' Bourdon's Algebra— <i>Chapters I–VI, inclusive</i> ; Davies' Legendre's Geometry— <i>Books I–V, inclusive.</i>
	ENGLISH LANGUAGE,	Clarke's English Analysis.
	FRENCH LANGUAGE,	Fasquelle's French Grammar— <i>Lessons I–L, inclusive.</i>
	GEODESY,	Line Surveying— <i>Elementary Practice.</i>
	GEOMETRICAL DRAWING,	Plane Problems.
Summer Session.	MATHEMATICS,	Davies' Bourdon's Algebra— <i>Chapters VII–IX, inclusive</i> ; Davies' Legendre's Geometry— <i>Books VI–IX, inclusive</i> ,— <i>Mensuration</i> ; Use of Mathematical Tables.
	PHYSICS,	Loomis' Natural Philosophy.
	ENGLISH LANGUAGE,	Quackenbos' Elements of English Composition and Rhetoric.
	FRENCH LANGUAGE,	Fasquelle's French Grammar, completed.
	GEODESY,	Line Surveying— <i>Elementary Practice.</i>
	GEOMETRICAL DRAWING,	Construction Drawing— <i>Elements of Drawing.</i>
DIVISION C.		
Winter Session.	MATHEMATICS,	Analytical Trigonometry— <i>Plane and Spherical Trigonometry</i> ; Analytical Geometry— <i>two dimensions.</i>
	DESCRIPTIVE GEOMETRY,	Elementary Projections— <i>Solids</i> ,— <i>Shadows</i> ,— <i>Isometrical Projections.</i>
	PHYSICS,	Physics of Heat.
	ENGLISH LANGUAGE,	English Composition; Logical and Rhetorical Criticism.
	FRENCH LANGUAGE,	English Translations— <i>Reading of French Scientific Authors.</i>
	GEODESY,	Line Surveying— <i>Theory</i> ,— <i>Chain Surveys</i> ,— <i>Compass Surveys.</i>
	GEOMETRICAL DRAWING,	Problems in Descriptive Geometry— <i>Elementary Projections</i> ; Construction Drawing— <i>Elements of Structures.</i>
	TOPOGRAPHICAL DRAWING,	Elementary Drawing; Topographical Plans.
Summer Session.	MATHEMATICS,	Algebra— <i>Higher Algebra</i> ; Analytical Geometry— <i>three dimensions.</i>
	DESCRIPTIVE GEOMETRY,	Orthographic Projections— <i>General Problems.</i>
	GEODESY,	Line Surveying— <i>Topographical Sketching</i> ,— <i>Farm Surveys.</i>
	CHEMISTRY,	Inorganic Chemistry.
	NATURAL HISTORY,	Botany.
	ENGLISH LANGUAGE,	English Composition; Logical and Rhetorical Criticism.
	FRENCH LANGUAGE,	English Translations; French Composition.
	GEOMETRICAL DRAWING,	Problems in Descriptive Geometry— <i>Orthographic Projections.</i>
	TOPOGRAPHICAL DRAWING,	Maps of Farm Surveys.

DIVISION B.

Winter Session.	MATHEMATICS,.....	Differential Calculus; Integral Calculus; Calculus of Variations.
	DESCRIPTIVE GEOMETRY,....	Orthographic Projections— <i>General Problems</i> .
	PHYSICS,.....	Electricity— <i>Terrestrial Magnetism,—Statical and Dynamical Electricity</i> .
	CHEMISTRY,.....	Practical Chemistry— <i>Qualitative Analysis,—Blow-pipe Analysis,—Determinative Mineralogy</i> .
	FRENCH LANGUAGE,.....	English Translations; French Composition.
	GEODESY,.....	Adjustment and Use of Instruments; Practical Trigonometry; Levelling; Topographical Surveying.
	GEOMETRICAL DRAWING,....	Problems in Descriptive Geometry— <i>Orthographic Projections</i> ; Machine Drawing— <i>Elements of Machines</i> .
	TOPOGRAPHICAL DRAWING,..	Maps of Topographical Surveys.

Summer Session.	RATIONAL MECHANICS,.....	Mechanics of Solids; Mechanics of Fluids.
	DESCRIPTIVE GEOMETRY,....	Shades and Shadows— <i>General Problems</i> ; Linear Perspective— <i>General Problems</i> .
	PHYSICS,.....	Acoustics; Optics.
	ASTRONOMY,.....	Descriptive Astronomy.
	NATURAL HISTORY,.....	Descriptive Geology.
	GEODESY,.....	Hydrographical Surveying— <i>Theory and Practice</i> .
	GEOMETRICAL DRAWING,....	Problems in Descriptive Geometry— <i>Shades and Shadows,—Perspective</i> ; Construction Drawing— <i>Bridge Drawing</i> .
	TOPOGRAPHICAL DRAWING,..	Colored Topography.

DIVISION A.

Winter Session.	MATHEMATICS,.....	Method of Least Squares.
	ASTRONOMY,.....	Spherical Astronomy; Practical Astronomy.
	PHYSICAL MECHANICS,.....	Mechanics of Solids— <i>Friction,—Strength of Materials</i> ; Mechanics of Fluids— <i>Practical Hydraulics,—Practical Pneumatics</i> .
	MACHINES,.....	Theory of Machines.
	DESCRIPTIVE GEOMETRY,....	Problems in Stone Cutting.
	NATURAL HISTORY,.....	Physical Geography.
	PHILOSOPHY,.....	Intellectual Philosophy.
	GEOMETRICAL DRAWING,....	Constructions in Stone Cutting.
	TOPOGRAPHICAL DRAWING,..	Maps of Hydrographical Surveys.

Summer Session.	MACHINES,.....	Theory of Prime Movers; Designs for, and reviews of Special Machines.
	CONSTRUCTIONS,.....	Stability of Structures; Construction of Engineering and Architectural Works; Designs for, and reviews of Special Works.
	GEODESY,.....	Road Engineering— <i>Theory and Practice</i> .
	CHEMISTRY,.....	Technical Chemistry.
	GEOLOGY,.....	Practical Geology; Technical Geology.
	PHILOSOPHY,.....	Ethical Philosophy.
	TOPOGRAPHICAL DRAWING,..	Plans, Profiles and Sections of Railway Surveys.

Course in Mechanical Engineering.

FOUR YEARS.

Departments of Instruction.

Subjects of Study.

DIVISION D.

THE COURSE IDENTICAL WITH THAT IN CIVIL ENGINEERING.

DIVISION C.

THE COURSE IDENTICAL WITH THAT IN CIVIL ENGINEERING.

DIVISION B.

Winter Session.	MATHEMATICS,.....	Differential Calculus; Integral Calculus; Calculus of Variations.
	DESCRIPTIVE GEOMETRY,....	Orthographic Projections— <i>General Problems</i> .
	PHYSICS,.....	Electricity— <i>Terrestrial Magnetism,—Statical and Dynamical Electricity.</i>
	CHEMISTRY,.....	Practical Chemistry— <i>Qualitative Analysis,—Blow-pipe Analysis,—Determinative Mineralogy.</i>
	FRENCH LANGUAGE,.....	English Translations; French Composition.
	GEODESY,.....	Adjustment and Use of Instruments; Practical Trigonometry; Levelling; Topographical Surveying.
	GEOMETRICAL DRAWING,....	Problems in Descriptive Geometry— <i>Orthographic Projections</i> ; Machine Drawing— <i>Elements of Machines.</i>
	TOPOGRAPHICAL DRAWING,..	Maps of Topographical Surveys.

Summer Session.	RATIONAL MECHANICS,....	Mechanics of Solids; Mechanics of Fluids.
	MACHINES,.....	Cinematics.
	DESCRIPTIVE GEOMETRY,....	Shades and Shadows— <i>General Problems</i> ; Linear Perspective— <i>General Problems.</i>
	PHYSICS,.....	Acoustics; Optics.
	ASTRONOMY,.....	Descriptive Astronomy.
	NATURAL HISTORY,.....	Descriptive Geology.
	GEOMETRICAL DRAWING,....	Problems in Descriptive Geometry— <i>Shades and Shadows,—Perspective</i> ; Machine Drawing— <i>Elements of Machines.</i>

DIVISION A.

Winter Session.	MATHEMATICS,.....	Method of Least Squares.
	ASTRONOMY,.....	Spherical Astronomy.
	PHYSICAL MECHANICS,....	Mechanics of Solids— <i>Friction,—Strength of Materials</i> ; Mechanics of Fluids— <i>Practical Hydraulics,—Practical Pneumatics.</i>
	MACHINES,.....	Construction of Machines; Location of Machines; Theory of Machines; Efficiency of Machines.
	PHILOSOPHY,.....	Intellectual Philosophy.
	GEOMETRICAL DRAWING,....	Machine Drawing— <i>Complete Machines.</i>
Summer Session.	MECHANICS,.....	Theory and Construction of Prime Movers; Designs and Estimates for, and reviews of Special Machines.
	CONSTRUCTIONS,.....	Stability of Structures.
	CHEMISTRY,.....	Technical Chemistry— <i>Chemistry of the Materials and Processes of Heating and Illumination.</i>
	PHILOSOPHY,.....	Ethical Philosophy.
	GEOMETRICAL DRAWING,....	Machine Drawing— <i>Complete Machines.</i>

Course in Topographical Engineering.

FOUR YEARS.

Departments of Instruction.

Subjects of Study.

DIVISION D.

THE COURSE IDENTICAL WITH THAT IN CIVIL ENGINEERING.

DIVISION C.

THE COURSE IDENTICAL WITH THAT IN CIVIL ENGINEERING.

DIVISION B.

Winter Session.	MATHEMATICS,.....	Differential Calculus ; Integral Calculus ; Calculus of Variations.
	DESCRIPTIVE GEOMETRY,....	Orthographic Projections— <i>General Problems</i> .
	PHYSICS,	Electricity — <i>Terrestrial Magnetism,—Static and Dynamical Electricity.</i>
	CHEMISTRY,.....	Practical Chemistry — <i>Qualitative Analysis,—Blow-pipe Analysis,—Determinative Mineralogy.</i>
	FRENCH LANGUAGE,.....	English Translations ; French Composition.
	GEODESY,	Adjustment and Use of Instruments ; Practical Trigonometry ; Levelling ; Topographical Surveying.
	GEOMETRICAL DRAWING,....	Problems in Descriptive Geometry — <i>Orthographic Projections.</i>
	TOPOGRAPHICAL DRAWING, ..	Maps of Topographical Surveys ; Colored Topography.

Summer Session.	RATIONAL MECHANICS,.....	Mechanics of Solids ; Mechanics of Fluids.
	DESCRIPTIVE GEOMETRY,....	Shades and Shadows — <i>General Problems</i> ; Linear Perspective— <i>General Problems.</i>
	PHYSICS,	Acoustics ; Optics.
	ASTRONOMY,.....	Descriptive Astronomy.
	NATURAL HISTORY,.....	Descriptive Geology.
	GEODESY,	Hydrographical Surveying— <i>Theory and Practice</i> ; Topographical Surveying.
	GEOMETRICAL DRAWING,....	Problems in Descriptive Geometry — <i>Shades and Shadows,—Perspective.</i>
	TOPOGRAPHICAL DRAWING, ..	Colored Topography.

DIVISION A.

Winter Session.	MATHEMATICS,.....	Method of Least Squares.
	ASTRONOMY,.....	Spherical Astronomy ; Practical Astronomy.
	PHYSICAL MECHANICS,.....	Mechanics of Solids— <i>Friction,—Strength of Materials</i> ; Mechanics of Fluids— <i>Practical Hydraulics,—Practical Pneumatics.</i>
	NATURAL HISTORY,	Physical Geography.
	PHILOSOPHY,	Intellectual Philosophy.
	GEODESY,	Higher Geodesy.
	TOPOGRAPHICAL DRAWING, ..	Maps of Topographical and Hydrographical Surveys.
Summer Session.	ASTRONOMY,.....	Spherical Astronomy ; Practical Astronomy.
	DESCRIPTIVE GEOMETRY,....	Orthographic Projections — <i>Topographical Projections</i> ; Shades and Shadows— <i>Gnomonics</i> ; Linear Perspective— <i>Spherical Projections.</i>
	GEODESY,	Higher Geodesy.
	PHILOSOPHY,	Ethical Philosophy.
	GEOMETRICAL DRAWING,....	<i>Topographical Projections</i> ; <i>Gnomonics</i> ; <i>Spherical Projections.</i>
	TOPOGRAPHICAL DRAWING, ..	Maps of Geodetical Surveys.

Course in Natural Science.

FOUR YEARS.

Departments of Instruction.

Subjects of Study.

DIVISION D.

THE COURSE IDENTICAL WITH THAT IN CIVIL ENGINEERING.

DIVISION C.

THE COURSE IDENTICAL WITH THAT IN CIVIL ENGINEERING.

DIVISION B.

Winter Session.	MATHEMATICS,.....	Differential Calculus; Integral Calculus.
	PHYSICS,	Electricity— <i>Terrestrial Magnetism,—Statical and Dynamical Electricity.</i>
	CHEMISTRY,	Organic Chemistry; Practical Chemistry— <i>Qualitative Analysis,—Blowpipe Analysis,—Determinative Mineralogy.</i>
	FRENCH LANGUAGE,.....	English Translations; French Composition.
	GEODESY,	Practical Trigonometry; Adjustment and Use of Instruments; Levelling; Topographical Surveying.
	TOPOGRAPHICAL DRAWING, ..	Maps of Topographical Surveys.

Sum'r Sess'n.	RATIONAL MECHANICS,....	Mechanics of Solids; Mechanics of Fluids.
	PHYSICS,	Acoustics; Optics.
	ASTRONOMY,	Descriptive Astronomy.
	NATURAL HISTORY,.....	Botany; Zoology; Palæontology; Descriptive Geology.
	CHEMISTRY,	Practical Chemistry— <i>Qualitative Analysis.</i>

DIVISION A.

Winter Sess'n.	MATHEMATICS,	Method of Least Squares.
	ASTRONOMY,	Spherical Astronomy.
	CHEMISTRY,	Practical Chemistry— <i>Qualitative Analysis,—Chemical Preparations.</i>
	NATURAL HISTORY,	Physical Geography.
	PHILOSOPHY,	Intellectual Philosophy.

Sum'r Sess'n.	GEOLOGY,	Practical Geology; Technical Geology.
	NATURAL HISTORY,	Mineralogy.
	CHEMISTRY,	Practical Chemistry— <i>Quantitative Analysis; Technical Chemistry.</i>
	PHILOSOPHY,	Ethical Philosophy.

Mode of Instruction.

The mode of instruction adopted by the Institute has been carefully matured by the aid of the accumulated experience of about forty years of successful operation, as well as the study of the workings of the best Polytechnic Schools of Europe. It is believed to be well adapted for securing, with the least expenditure of time and labor, that high grade of scholarship, which is justly esteemed so indispensable to the successful Engineer, and the Practical Scientist.

Lectures, with full illustrations, are given on most of the Experimental, Practical and Technical Courses; and these are written out by the students in their lecture-books, and carefully corrected by the instructors. In the other courses, text-books are used in the usual manner. The Practical Exercises, consisting of Geometrical and Topographical Drawing, Field Work, Laboratory Work, Astronomical Observations, Botanical and Geological Excursions, are esteemed essential parts of the Course of Instruction, and are therefore given with that fullness and care which their importance demands.

Records and Examinations.

SESSION RECORDS.

Daily records of the various exercises of the Institute classes, are kept by the officers of instruction in a form adapted to permanent preservation. These are returnable weekly to the Director, and give full information with regard to each Student's position, both as respects observed characteristics of general conduct, and the knowledge displayed by him of the current subjects of study.

SEMI-ANNUAL EXAMINATIONS.

Public Examinations of all the classes of the Institute are held immediately preceding the close of each semi-annual session. These examinations, which are partly oral and in part written, are continued simultaneously over a period of about ten days, and are made to cover the entire field of study for the session.

GRADUATING THESES.

In addition to the other examinations of the summer session, each candidate for a Degree is required to prepare and defend a Thesis on some subject of immediate relation to the studies of his course. The Thesis of a candidate for a Degree is required to be either a Review of, or a Design for a Machine, Structure, or Process, belonging to a department of Scientific or Practical Technics. It must be fully elaborated, in accordance with the instructions given for this purpose, and accompanied by the necessary illustrative or working drawings, models, or other preparations requisite for the proper elucidation of the subject of the Thesis, and adaptation, if a design, to practical use.

The Theses, with the accompanying drawings, models, etc., are required to be deposited in the Library of the Institute, for permanent preservation.

RESULTS OF THE EXAMINATIONS.

Full records of the examinations are made, from the results of which the necessary data are obtained for determining each student's qualifications for being considered *passed* or *deficient*, as the case may require, in the studies of the session.

No change in class-membership, in passing from the winter to the summer session, necessarily happens from either of these alternatives in respect to the results of the winter examinations. At the summer examinations, however, each student is required to be passed not only in the various studies of this session, but in all those studies of the previous session, for which a record of deficiency had been entered against him, *in order to satisfy the essential requisite for translation from a lower to a higher Class*, in passing from the studies of one year to those of the succeeding year.

Testimonials.

DEGREES.

The Institute confers the several Degrees of CIVIL ENGINEER, (C. E.,) MECHANICAL ENGINEER, (M. E.,) TOPOGRAPHICAL ENGINEER, (T. E.,) and BACHELOR OF SCIENCE, (B. S.) No one, however, is admitted to either of these degrees except he shall have been a member of the Institute, and only then upon the basis of satisfactory evidence of full qualifications for such a testimonial.

CONDITIONS ON WHICH DEGREES ARE CONFERRED.

- 1.—The candidate must have been passed in all the studies of the Course which corresponds to the Degree.
- 2.—His Thesis must be satisfactory.
- 3.—He must have paid all dues to the Institute.
- 4.—He must be of good moral character.

SPECIAL CERTIFICATES.

SPECIAL CERTIFICATES are issued, when desired, to those who have completed the full course of studies of Division B, and are in full standing.

Rules and Directions.

ADMISSION TO THE INSTITUTE.

All applications for admission to the institute, or for special information concerning it, should be addressed to the **DIRECTOR OF THE INSTITUTE**. Copies of the **ANNUAL REGISTER** may be obtained on application, either to the Director, or to **W. H. YOUNG**, Treasurer of the Institute, 216 River Street, Troy, N. Y.

The proper time—that is the *best* time—for entering the Classes of the Institute, is at the beginning of the scholastic year in September. Students are admitted, however, at the opening of the summer session, or at any other time in the year; but if not fully prepared on the previous work of the class, they are then obliged to make up their deficiencies by *extra efforts* during the session.

It is earnestly recommended to those who contemplate entering upon either of the courses of the Institute, to commence with the studies of Division D, rather than attempt those of Division C by means of an incomplete or superficial preparation, even when it is possible—as it only is in such a case—to enter the class in conditional standing. The requirements for entering Division D may be readily met; after which, with due attention to the studies of the class, a degree of disciplinary culture may be reached, not only sufficient for fully meeting the prescribed requirements for entering Division C, but peculiarly well adapted for *introducing* the student to the studies of this class.

EXPENSES.

Institute Fees.—In the general courses, the fees for instruction, use of astronomical and field instruments, use of consumable materials, chemicals, etc., are \$75 for each semi-annual session; and in the partial courses, they are in the same proportion for the time of study. These Fees must be paid to the Treasurer in advance for each session. The Graduation Fee, including the Diploma, is \$18, and must be paid to the Treasurer at least two weeks before the time of graduation. There are no extra charges.

Living Expenses.—Members of the Institute find board and lodgings with respectable private families in the city. The prices asked for board and furnished lodgings vary, at the present time, from \$4.00 to \$6.00 per week. The total living expenses, which include board, furnished lodgings, laundry, fires, lights and attendance, vary from about \$200 to \$300 for the scholastic year.

For those parents or guardians desiring it, funds may be placed in the keeping of the Treasurer of the Institute, who will disburse and render an account of the same, (charging a commission of two and a half per cent. on the amount of his disbursements,) either to the order of the student directly, or to that of the President, Director, or other officer of the Institute. It is always liable to be injurious, unless the student be accustomed to habits of self-control, to allow him too free command of pocket money. There is little necessity for spending much money during the student's life at the Institute; and the supply of any more money than what is sufficient for his proper wants is very apt to be *worse than useless*.

STUDENT'S FURNISHINGS.

Drawing Instruments.—The instruments used at the Institute are the Swiss,—which are preferred both for their general excellence and moderate cost. These instruments, with the materials for geometrical and topographical drawing, cost from \$15 to \$35. The student is advised to defer his purchases of drawing instruments and materials until he comes to the Institute, when he will have the advantage of procuring them under the direction of the professors of drawing.

Chemical Instruments.—A blowpipe, platinum wire, certain re-agents, bottles, test tubes, etc., are required by each student for the courses in practical chemistry, and can be obtained at the cost of about \$8.

Text-Books and Stationery.—The text-books, etc., used at the Institute, may be purchased at the city bookstores. The student is advised, however, to bring such scientific books as he may possess.

Field Service and Excursions.—All who come here are advised to bring or provide themselves with a suit of heavy and substantial clothing, boots, etc., for field service, and for the botanical and geological excursions.

SESSIONS AND VACATIONS.

The scholastic year is divided into two sessions. The first or winter session consists of twenty-one weeks, and is followed by a vacation of one week. The second or summer session consists of twenty weeks, and is followed by a vacation of ten weeks.

Students are particularly requested to be punctual in their attendance at the opening of the sessions, as indicated in the Calendar.

General Information.

INSTITUTE BUILDINGS.

The Principal Institute Building, which is now entirely completed and ready for occupation, is a substantial and imposing structure, 115 feet long, 50 feet wide, and four stories high. It contains full suites of Lecture, Recitation and Drawing Rooms, the Cabinet of Natural History, the Library and the Quarters for Janitor. The rooms are spacious, commodious and well ventilated. A Chemical Laboratory, of the most approved form of construction, will be erected probably during the present year. An Astronomical Observatory will be erected soon. The site selected for the new buildings, on the eastern slope of the city, at the head of Broadway, combines the advantages of a commanding position and quiet surroundings, with convenience of access.

APPARATUS AND LIBRARY.

The collections of apparatus in the Departments of Astronomy, Geodesy and Physical Science, are quite complete, and in good order; but it is expected that these will be increased hereafter, as well as those in the other Departments. The Library consists mostly of scientific works, and at present, is quite small. It is probable, however, that it will receive very important additions during the present year.

CABINET OF NATURAL HISTORY.

The former Cabinet of Natural History was entirely destroyed by the great fire of 1862. The formation of a new Cabinet has since been commenced. The Cabinet, at present, consists of a small but valuable collection of minerals, recently purchased in Europe, and of the entire collections of the "Troy Lyceum of Natural History." It will be increased soon by a complete collection of the fossils of the State of New York, which have been donated by the Legislature.

Appendix.

GRADUATES OF THE INSTITUTE.

The following Catalogue includes the Graduates of the Institute from its foundation in 1824, to the end of the scholastic year of 1863. The degree conferred previous to 1835 was Bachelor of Arts, A. B. (r. s.)—the last two letters in the abbreviation being the initials of "Rensselaer School," the former name of the Institute. As it is very desirable to make this Catalogue as reliable as may be, all graduates of the Institute are urgently requested to forward to the Director, in the months of May and October of each year, a full statement of any changes in their positions, or in those of their class-mates or other graduates, of which they may be advised.

It is proposed, as soon as definite information concerning all the graduates shall have been obtained, to publish, in a separate pamphlet, the complete catalogue of graduates, together with a sketch of the origin, history and character of the Institute.

CLASS OF 1826.

STILLMAN E. ARMS, A. B. (r. s.), M. D., Physician,.....	<i>Elizabethtown, N. J.</i>
*ABNER BENEDICT, A. B. (r. s.), Attorney and Counsellor at Law,....	<i>New York City.</i>
ALBERT DANKER, A. B. (r. s.), Civil Engineer,.....	<i>Troy, N. Y.</i>
*HEZEKIAH H. EATON, A. B. (r. s.),	<i>Lexington, Ky.</i>
*TIMOTHY DWIGHT EATON, A. B. (r. s.),	<i>Troy, N. Y.</i>
*EBENEZER EMMONS, A. B. (r. s.), A. M., M. D., late Professor of Geology and Mineralogy in Williams College, and State Geologist of North Carolina,.....	<i>Williamstown, Mass.</i>
ADDISON HULBERT, A. B. (r. s.),	
PHILIP C. W. T. McMANUS, A. B. (r. s.), Agriculturist,.....	<i>Brunswick, N. Y.</i>
*WILLIAM S. PELTON, A. B. (r. s.), M. D., Physician,.....	<i>Ithaca, N. Y.</i>
BENNET F. ROOT, A. B. (r. s.), M. D., Physician,.....	<i>Manchester, Mich.</i>

CLASS OF 1827.

*JONATHAN CHANDLER, A. B. (r. s.), M. D., Physician,.....	<i>Bennington, Vt.</i>
JOHN J. DAVY, A. B. (r. s.),	
FRANCIS G. DREW, A. B. (r. s.),	<i>Drewsville, N. H.</i>

*Deceased.

ASA FITCH, JR., A. B. (r. s.,) M. D., Physician and Entomologist,.....*Salem, N. Y.*
 GEORGE F. HORTON, A. B. (r. s.,) M. D., Physician,.....*Terrytown, Pa.*
 SAMUEL C. JACKSON, A. B. (r. s.,) _____
 JOHN C. KEENEY, A. B. (r. s.,) Clergyman, _____
 *ORLIN OATMAN, A. B. (r. s.,) Merchant,.....*Port Washington, Wis.*
 *EDWARD SANFORD, A. B. (r. s.,) Attorney and Counsellor at Law,....*New York City.*
 CHARLES L. WESTON, A. B. (r. s.,) Attorney and Counsellor at Law,..*Burlington, N. J.*

CLASS OF 1828.

*HIRAM ARNOLD, A. B. (r. s.,) _____ *Amsterdam, N. Y.*
 *GARDNER BULLARD, A. B. (r. s.,) _____
 *FAY EDGERTON, A. B. (r. s.,) _____ *Utica, N. Y.*
 THOMAS EMORY, JR., A. B. (r. s.,) _____
 WILLIAM HENRY, A. B. (r. s.,) _____
 THOMAS C. RIPLEY, A. B. (r. s.,) _____

CLASS OF 1829.

JOHN M. BARROWS, A. B. (r. s.,) A. M., Professor of Chemistry and Botany in Olivet
 College,.....*Olivet, Mich.*
 CYRUS BRYANT, A. B. (r. s.,) Agriculturist,.....*Princeton, Ill.*
 JOSEPH B. CLARKE, A. B. (r. s.,) _____
 DANIEL O. COMSTOCK, A. B. (r. s.,) _____
 MINER GOLD, A. B. (r. s.,) A. M., _____
 JAMES S. HORTON, A. B. (r. s.,) M. D., _____
 *DOUGLASS HOUGHTON, A. B. (r. s.,) M. D., late State Geologist of Michigan,.....
*Detroit, Mich.*
 LYSANDER H. KINGMAN, A. B. (r. s.,) _____ *Norfolk, Va.*
 *JEREMIAH B. METCALF, A. B. (r. s.,) Civil Engineer,.....*Sandwich Islands.*
 *ALANSON J. PRIME, A. B. (r. s.,) M. D., Physician,.....*White Plains, N. Y.*
 JOHN L. RIDDELL, A. B. (r. s.,) M. D., Physician and Chemist,.....*New Orleans, La.*

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 *THEODORE W. DECKER, A. B. (r. s.,) Agriculturist and Manufacturer,.....
*Blooming Grove, N. Y.*
 ALBERT R. FOX, A. B. (r. s.,) Glass Manufacturer,.....*Sand Lake, N. Y.*
 LEMUEL G. OLMSTEAD, A. B. (r. s.,) _____
 *GEORGE K. OSBORN, A. B. (r. s.,) Attorney and Counsellor at Law,.....*Troy, N. Y.*
 SAMUEL J. PIKE, A. B. (r. s.,) _____
 *MERRITT PLATT, A. B. (r. s.,) late Superintendent of the High School, *Milford, Conn.*
 RUSH SHERRILL, A. B. (r. s.,) Merchant,.....*New York City.*
 P. EUGENE STEVENSON, A. B. (r. s.,) A. M., Clergyman and Secretary—
*New York City.*
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 WILLIAM WILKINSON, A. B. (r. s.,) Attorney and Counsellor at Law,.....
*Poughkeepsie, N. Y.*

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*EDWARD DEVOL, A. B. (r. s.) Merchant,	_____
AUGUSTUS G. HILL, A. B. (r. s.)	_____
ABRAM SAGER, A. B. (r. s.) A. M., M. D., Professor of Obstetrics, etc., in the University of Michigan,	Ann Arbor, Mich.
ABEL STORRS, A. B. (r. s.) Agriculturist,	Lebanon, N. H.

CLASS OF 1832.

WILLIAM H. BOYD, A. B. (r. s.) Merchant,	Monroe, Mich.
JAMES HALL, A. B. (r. s.) LL. D., N. Y. State Palæontologist, and Professor of Theoretical, Practical and Mining Geology in the Rensselaer Polytechnic Institute,	Albany, N. Y.
*JOHN H. PHILIP, A. B. (r. s.) M. D., Physician,	Mellenville, N. Y.
SAMUEL W. WILLIAMS, A. B. (r. s.) D. D., Missionary,	China.

CLASS OF 1833.

JOHN G. AMBLER, A. B. (r. s.)	_____
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WILLIAM S. SANDERS, A. B. (r. s.)	_____
DAVID C. SMITH, A. B. (r. s.)	_____
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BLEEKER B. WOODWORTH, A. B. (r. s.)	_____

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D. S. SMALLEY, B. N. S., Principal of Classical School,	Jamaica Plain, Mass.
EDWARD SCFFERN, C. E., Agriculturist,	Wilmington, Ill.
*MICHAEL TUOMEY, B. N. S., late State Geologist of South Carolina and Alabama,	_____
AMOS WESTCOTT, C. E., B. N. S.,	_____

CLASS OF 1836.

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TYRUS W. HURD, C. E.,	Cal.
AARON G. MCKEE, C. E.,	West Arlington, Vt.
ISRAEL SLADE, C. E., B. N. S.,	Springfield, W. Va.
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*NATHAN R. WILDE, C. E.,	Worthington, Ind.

*Deceased.

CLASS OF 1837.

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HENRY BAKER, C. E.,	_____	_____
B. FRANKLIN BUCK, C. E.,	_____	<i>West Arlington, Vt.</i>
CHARLES R. COOK, C. E.,	_____	_____
E. THOMPSON GALE, C. E., President of the Farmer's Bank,	_____	<i>Troy, N. Y.</i>
LEMAN B. GARLINGHOUSE, C. E., Manufacturer,	_____	<i>Canandaigua, N. Y.</i>
FLETCHER J. HAWLEY, C. E., A. M., Clergyman,	_____	<i>Arlington, Vt.</i>
GEORGE JOHNSON, C. E.,	_____	_____
LEVI S. LOCKLING, C. E., B. N. S.,	_____	_____
JAMES OAKLEY, C. E.,	_____	_____
AARON B. OLMSTEAD, C. E., B. N. S., Deputy Collector, Custom House,	_____	<i>New York City.</i>
STEPHEN V. R. PATTERSON, C. E., Cashier of the City Bank,	_____	<i>Perth Amboy, N. J.</i>
HORACE N. ROGERS, C. E.,	_____	_____
HENRY K. SNYDER, C. E.,	_____	<i>Johnstown, N. Y.</i>
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LEVI H. WARREN, C. E.,	_____	_____
*CHARLES WHIPPLE, C. E., M. D., Physician,	_____	<i>Nyack, N. Y.</i>
JOHN WOODWORTH, JR., C. E.,	_____	_____

CLASS OF 1838.

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WILLIAM C. BAILEY, B. N. S., M. D., Physician,	_____	<i>Chatham, N. Y.</i>
*CHARLES S. FIELD, C. E., Civil Engineer,	_____	<i>Texas.</i>
JEROME B. HOWARD, C. E., Artist,	_____	<i>New Haven, O.</i>
*JOHN A. ROBISON, B. N. S., Contracting Engineer,	_____	<i>Santiago, Cuba.</i>
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STEPHEN T. WHIPPLE, C. E.,	_____	_____

CLASS OF 1839.

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GEORGE H. COOK, C. E., B. N. S., Ph. D., Professor of Chemistry and Natural Philosophy in Rutgers College,	_____	<i>New Brunswick, N. J.</i>
*ELIHU W. COTES, C. E., Merchant,	_____	<i>Warren, O.</i>
GEORGE R. DENNIS, B. N. S.,	_____	_____
HENRY J. DRAYTON, C. E.,	_____	_____
WILLIAM GURLEY, C. E., Manufacturer of Mathematical Instruments,	_____	<i>Troy, N. Y.</i>
STRICKLAND KNEASS, C. E., Chief Engineer and City Surveyor,	_____	<i>Philadelphia, Pa.</i>
*JOHN VAN NISS PHILIP, B. N. S., late Lieut. in the U. S. Navy,	_____	_____
*JAMES H. POST, C. E.,	_____	_____
GEORGE C. POTTER, C. E.,	_____	<i>San Francisco, Cal.</i>
WILLIAM J. POWELL, C. E.,	_____	_____
ORRIN STEBBINS, C. E., B. N. S.,	_____	_____
JAMES TILGHMAN, B. N. S., C. E.,	_____	_____
PETER VAN RENSSELAER, B. N. S., C. E.,	_____	_____
*AUGUSTUS P. VAN SCHAICK, C. E., Merchant,	_____	<i>Brazil, S. A.</i>
FRANCIS G. WOODWARD, C. E., Mechanical Engineer,	_____	<i>Worcester, Mass.</i>

*Deceased.

CLASS OF 1840.

CHARLES H. ANTHONY, B. N. S., A. M., Principal of Classical Institute, *Albany, N. Y.*
 CHARLES COLLINS, C. E., B. N. S., Chief Engineer of the Cleveland, Painesville and
 Ashtabula Railroad, *Cleveland, O.*
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 ANSON DURHAM, C. E., *Galesville, N. Y.*
 ABEL N. HASKIN, B. N. S., C. E., Cotton Manufacturer, *Battenville, N. Y.*
 ALFRED B. HASKIN, C. E., B. N. S., Cotton Manufacturer, *Battenville, N. Y.*
 *WILLIAM LEWIS, C. E., B. N. S., M. D., Druggist, *Burlington, Wis.*
 AUSTIN F. PARK, C. E., B. N. S., A. M., Solicitor of Patents, *Troy, N. Y.*
 SAMUEL B. PARSONS, C. E.,
 GEORGE H. STARBUCK, C. E., Manufacturer of Steam Engines, etc., *Troy, N. Y.*
 *WILLIAM G. VOUGHT, C. E., B. N. S., *Victory, N. Y.*
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 NATHAN COTTERELL, 2d, C. E., Agriculturist, *Hoosac Falls, N. Y.*
 JOEL B. HARRIS, C. E., Superintendent of Iron Works, *Rutland, Vt.*
 LEONARD W. HASKIN, C. E., Cotton Manufacturer, *Battenville, N. Y.*
 CHARLES B. HYDE, C. E., Civil Engineer,
 DOUGLASS W. HYDE, C. E., Manufacturer, *Pittstown, N. Y.*
 JOSEPH H. JENNY, C. E., Manufacturer, *Troy, N. Y.*
 EDWARD R. KELLOGG, C. E., B. N. S., Real Estate Agent, *New York City.*
 NATHAN KELLOGG, C. E., Merchant, *Malden, N. Y.*
 LOUIS LA COSTE, C. E.,
 SENECA H. MARLETT, C. E., B. N. S., Civil and Mining Engineer, . . *Virginia City, Nev.*
 SOLOMON V. R. MILLER, C. E., Agriculturist, *Schaghticoke, N. Y.*
 HENRY POMEROY, C. E., A. M., Professor of Mathematics and Civil Engineering in the
 Lawrence University, *Appleton, Wis.*
 LODOWICK STANTON, JR., C. E., Civil Engineer, *Freeport, Ill.*
 GEORGE TIBBITS, C. E., Manufacturer, *Troy, N. Y.*
 ROBERT H. VAN BERGEN, C. E., Agriculturist, *Corsackie, N. Y.*

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 B. FRANKLIN GREENE, C. E., B. N. S., A. M., Chief Clerk, Bureau of Navigation,
 *Washington, D. C.*
 FITZ EDWARD HALL, C. E., A. M., D. C. L., Professor of Hindustani and Hindu Law in
 King's College, *London, England.*
 AARON L. LINDSLEY, C. E., A. M., Clergyman, *South Salem, N. Y.*
 JOHN MCCOUGHIN, C. E.,
 *IRA R. PRATT, C. E., B. N. S., *Prattsburgh, N. Y.*
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CLASS OF 1844.

JOHN HENRY BRODT, C. E., B. N. S., A. M., Clergyman,.....*Marysville, Cal.*
 JONATHAN B. RIDER, B. N. S., C. E., Agriculturist,.....*Chatham, N. Y.*
 GILBERT T. TAYLOR, C. E., B. N. S., ————

CLASS OF 1845.

JOSEPH E. CLARK, B. N. S., M. D., Physician,.....*Brooklyn, N. Y.*
 *STEPHEN E. HASKELL, B. N. S., C. E., Manufacturer,.....*Lansingburgh, N. Y.*
 GOODWIN LOWREY, C. E., B. N. S., ————
 THOMAS B. RIDER, C. E., Agriculturist,.....*Chatham, N. Y.*
 JAMES A. SKILTON, B. N. S., Attorney at Law,.....*Troy, N. Y.*

CLASS OF 1846.

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 SAMUEL S. GREELE, A. B., C. E., Civil Engineer, and Superintendent of a Manufactory,
*Chicago, Ill.*
 WILLIAM HALL, C. E., B. N. S., Civil Engineer,.....*Mobile, Ala.*
 WILLIAM A. INGHAM, C. E., B. N. S., LL. B., Attorney and Counsellor at Law,.....
*Philadelphia, Pa.*
 ALEXANDER M. LESLIE, B. N. S., Merchant,.....*New York City.*
 JOHN E. MAY, B. N. S., C. E., Merchant,.....*Boston, Mass.*
 JONATHAN R. POWELL, C. E., B. N. S., Agriculturist,.....*Chatham, N. Y.*
 JAMES A. PENFIELD, B. N. S., Capt. U. S. Cavalry, (Volunteers.) ————
 PERCIVAL ROBERTS, B. N. S., C. E., Builder of Iron Bridges, and Manufacturer of Car
 Axles,.....*Philadelphia, Pa.*
 JAMES H. SALISBURY, B. N. S., M. D., ————
 SAMUEL W. SUTHERLAND, C. E., Agriculturist,.....*Bloomington, Ill.*

CLASS OF 1847.

ROBERT G. COOK, B. N. S., ———— *Dallas, Oregon.*
 CHARLES DROWNE, C. E., B. N. S., A. M., Director of, and Professor of Mechanics in
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 RICHARD EDWARDS, JR., B. N. S., C. E., Principal of the State Normal University,....
*Bloomington, Ill.*
 *GEORGE A. GALE, B. N. S., Agriculturist,.....*Northborough, Mass.*
 JOHN W. MURPHY, B. N. S., C. E., Civil Engineer, and Contractor for Iron Bridges,
*Philadelphia, Pa.*
 GEORGE W. PLYMPTON, C. E., A. M., Professor of Physical Science in the Brooklyn
 Collegiate and Polytechnic Institute,.....*Brooklyn, N. Y.*
 *AUGUSTUS ROSSMAN, C. E., Agriculturist,.....*Claverack, N. Y.*
 ADRIAN VAN SINDEREN, B. N. S., C. E., A. M., Attorney and Counsellor at Law,.....
*New York City.*

J. FORMAN WILKINSON, C. E., Assistant Superintendent of the New York Central Railroad,.....*Syracuse, N. Y.*
 JOEL R. WOODRUFF, C. E., Civil Engineer,.....*Washington, D. C.*
 ALFRED A. WOTKINS, C. E., B. N. S., A. B., Merchant,.....*Troy, N. Y.*

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JASPER N. BALL, C. E., A. B., Home Missionary,.....*Oconto, Wis.*
 A. LAMONT CHUBB, C. E., B. N. S., Merchant,.....*Grand Rapids, Mich.*
 C. FREDERIC CREHORE, C. E., M. D., Physician,.....*Boston, Mass.*
 J. FRANKLIN HOUGHTON, C. E., Surveyor-General of California,.....*Sacramento, Cal.*
 ISAAC G. JOHNSON, B. N. S., C. E., Manufacturer of Malleable Iron, *Spuyten Duyvil, N. Y.*
 ELMER H. LOCKE, B. N. S.,
 LEWIS G. LOWE, C. E., B. N. S., A. M., M. D., *Bridgewater, Mass.*
 J. G. NICKERSON, B. N. S., *Lynn, Mass.*
 HENRY SEDLEY, C. E.,
 JAMES G. THOMPSON, B. N. S., Editor of "The Free South,".....*Beaufort, S. C.*

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 CHARLES A. CUMMINGS, B. N. S., C. E., Architect,.....*Boston, Mass.*
 JOSEPH S. FISHER, C. E., *Memphis, Tenn.*
 JAMES H. FROTHINGHAM, B. N. S., C. E., Merchant, *New York City.*
 *GEORGE M. HALL, C. E., Merchant,..... *Bastrop, Texas.*
 *HOLLAM L. PECK, C. E., Civil Engineer,..... *Schenectady, N. Y.*
 GEORGE B. ROBERTS, C. E., B. N. S., Chief Engineer of the Allentown R. R., Mahanoy
 and Broad Mt. R. P., Western Pa. R. R., and Cape May R. R., *Philadelphia, Pa.*
 PORTER ROCKENSTYNE, C. E.,
 JULIUS A. SKILTON, B. N. S., A. B., M. D., Surgeon in the U. S. Army,
 GEORGE A. STEARNS, C. E., Manager of the Bleaching Works of the Boston Manufacturing Co.,..... *Waltham, Mass.*
 *BENJAMIN TURNER, C. E., late Chief Engineer of the R. R., *Nicaragua.*
 ALFRED WILKINSON, C. E., Banker,..... *Syracuse, N. Y.*

CLASS OF 1850.

EDWARD A. H. ALLEN, C. E., Principal of a School for Young Ladies,.....
 *New Bedford, Mass.*
 JOHN F. BARNARD, C. E., Chief Engineer and Superintendent of the Montreal and Champlain Railroad,..... *Montreal, C. E.*
 *JAMES W. BRADSHAW, C. E., *Lansingburgh, N. Y.*
 JOSÉ TELL FERRAO, B. S., Principal of a School for Young Ladies, *Brazil.*
 CORNELIUS S. MASTEN, C. E., Lieut. U. S. Cavalry, (Volunteers,)
 NATHANIEL MORTON, C. E., Treasurer of the Warren Roofing Company, *New York City.*

CLASS OF 1851.

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- *CHARLES L. LOOMIS, C. E., late Division Engineer on the Minneapolis and Cedar Valley Railroad,..... *Northfield, Minn.*
 S. EDWARD WARREN, C. E., Professor of Descriptive Geometry and Geometrical Drawing in the Rensselaer Polytechnic Institute,.... *Troy, N.Y.*

(In consequence of the extension of the Courses of study, none were graduated in the year 1852.)

CLASS OF 1853.

- JOHN A. BAGLEY, C. E., Civil Engineer,..... *New York City.*
 FREDERIC O. BURHANS, B. S., Assistant Superintendent of a Manufactory,..... *Warrensburgh, N. Y.*
 DASCOM GREENE, C. E., Professor of Mathematics and Astronomy in the Rensselaer Polytechnic Institute,..... *Troy, N. Y.*
 CHARLES M. OSBORNE, C. E., Attorney and Counsellor at Law,.... *Rock Island, Ill.*
 WILLIAM TWEEDDALE, C. E., Major U. S. Engineers, (Volunteers,) _____
 GEORGE C. WATRIS, C. E., _____

CLASS OF 1854.

- CALVIN ACKLEY, C. E., Civil Engineer, *Kinderhook, N. Y.*
 *THOMAS K. BALTZELL, C. E., late Assistant Engineer on the — R. R., *Tallahassee, Fla.*
 J. MORTON CLINCH, C. E., Manufacturer of Chronometers and Astronomical Clocks,.... *Boston, Mass.*
 HENRY CURTIS, C. E., Attorney and Counsellor at Law,.... *Rock Island, Ill.*
 *JOSEPH A. MOAK, C. E., Civil Engineer,..... *Richmond, Va.*

CLASS OF 1855.

- JAMES T. ALLEN, B. S., Associate Principal of the English and Classical School,..... *West Newton, Mass.*
 FRANCIS COLLINGWOOD, C. E., Acting City Engineer,..... *Elmira, N. Y.*
 *CHARLES E. CROSS, C. E., late Capt. U. S. Engineers, _____
 FREDERIC GRINNELL, C. E., Draughtsman to the Corliss Steam Engine Co., *Providence, R. I.*
 HENRY HOLMES, C. E., Third Assistant Engineer in the U. S. Navy,..... *Flag-ship "Wachusett."*
 AUGUSTO DE LACERDA, B. S., Superintendent of a Manufactory, near *Bahia, Brazil.*

CLASS OF 1856.

- C. WHITMAN BOYNTON, C. E., Mining Engineer, _____ *Cal.*
 LEICESTER BURNETT, C. E., Assistant Engineer on the Cedar Rapids and Missouri River Railroad,..... *Cedar Rapids, Ia.*
 *NICHOLAS H. CHAMBERLAINE, C. E., Civil Engineer,..... *Keokuk, Ia.*
 JOHN M. CLARKE, C. E., Civil Engineer,..... *Chicago, Ill.*
 JOSEPH P. DAVIS, C. E., Topographical Engineer to the Government of Peru, *S. A.*
 JOHN D. ESTABROOK, C. E., Assistant City Engineer,..... *Boston, Mass.*
 GEORGE F. ELLS, C. E., Civil Engineer and Manufacturer,.... *Troy, N. Y.*
 CHARLES C. MARTIN, C. E., Civil Engineer and Superintendent of the Trenton Ward Ordnance Works, *Trenton, N. J.*
 WILLIAM H. MARTIN, C. E., Contracting Engineer for Bridges, _____ *Cal.*
 HIRAM F. MILLS, C. E., Assistant Engineer at the Hoosac Tunnel, *Hoosac Tunnel, Mass.*

JOHN H. QUACKENBUSH, C. E.,	Troy, N. Y.
GILMAN TRAFTON, C. E., Chief Engineer of the U. S. Military Railroads,	Nashville, Tenn.
WILLIAM W. WALKER, C. E., Vice President and Chief Engineer of the Cedar Rapids and Missouri River Railroad,	Cedar Rapids, Ia.
JOHN A. WILSON, C. E., Chief Engineer of the Philadelphia and Erie Railroad,	Williamsport, Pa.
EDMUND YARDLEY, C. E., Principal Assistant Engineer on the Philadelphia and Erie Railroad,	Williamsport, Pa.

CLASS OF 1857.

FREDERIC Y. DABNEY, C. E., Assistant Engineer on the Vicksburgh, Shreveport and Texas Railroad,	Monroe, La.
ROBERTO ESCOBAR, C. E., Assistant Engineer on the City Water Works, and Assistant Professor of Mathematics in Santa Barbara College,	Havana, Cuba.
T. ORLANDO HOPKINS, C. E., Civil Engineer and County Surveyor,	Alvarado, Cal.
G. FREDERIC KIRBY, C. E., Assistant Engineer on the Missouri River and Cedar Rapids Railroad,	Cedar Rapids, Ia.
GABRIEL LEVERICH, C. E.,	Trenton, N. J.
CHARLES MACDONALD, C. E., Assistant Engineer on the Philadelphia and Reading Railroad,	Pottstown, Pa.
JOHN OSTROM, A. B., C. E., Civil Engineer,	Virginia City, Nev.
WILLIAM M. PRATT, C. E., Adjutant U. S. Infantry, (Volunteers,)	
WASHINGTON A. ROEBLING, C. E., U. S. Topographical Engineers,	
FRANCISCO TRUJILLO, C. E., Assistant Engineer on the Public Works of Havana,	Havana, Cuba.
HEZEKIAH WATKINS, C. E., A. B., LL. B., Capt. U. S. Infantry, (Volunteers,)	
DE VOLSON WOOD, C. E., A. M., Professor of Civil Engineering in the University of Michigan,	Ann Arbor, Mich.

CLASS OF 1858.

JAMES C. COIT, A. B., C. E.,	
THEODORE COOPER, C. E., Third Assistant Engineer in the U. S. Navy,	Steamer "Chocura."
WILLIAM HOWARD DOUGHTY, C. E.,	Troy, N. Y.
ALBERT H. EMERY, C. E., Manufacturer of A. H. Emery's Patent Anti-Friction Presses,	New York City.
CLARK FISHER, C. E., First Assistant Engineer in the U. S. Navy,	Steamer "Marblehead."
HENRY HARLEY, C. E., Merchant,	Pittsburgh, Pa.
GEORGE HUNT, C. E., Civil and Mining Engineer,	Gold Hill, Nev.
JOSEPH M. KNAP, C. E., Chief of U. S. Artillery, 12th Army Corps, (Volunteers,)	
WILLIAM METCALF, C. E., General Superintendent of the Fort Pitt Foundry,	Pittsburgh, Pa.
*HENRY W. MERIAN, C. E., late Third Assistant Engineer in the U. S. Navy,	Steamer "Weckauken."
ARIO PARDEE, JR., C. E., Col. U. S. Infantry, (Volunteers,)	
GEORGE H. PIERCE, C. E., Mining Engineer,	Montreal, C. E.

*Deceased.

JOSEPH G. RICE, C. E., Civil Engineer and Superintendent of Silver Mines, — *Mex.*
 L. FREDERIC RICE, C. E., Lieut. U. S. Infantry, (Volunteers,) —
 RICHARD P. ROTHWELL, C. E., Mining Engineer,.....*London, England.*
 J. GARDNER SANDERSON, C. E., Banker and Broker,.....*New York City.*
 JOSEPH M. WILSON, C. E., Resident Engineer on the Middle Division of the Pennsylvania Railroad,.....*Altoona, Pa.*
 CHARLES W. WINSLOW, C. E., Assistant Engineer on the Atlantic and Great Western Railroad,.....*Jamestown, N. Y.*

CLASS OF 1859.

ALEXANDER J. CASSATT, C. E., Resident Engineer on the Middle Division of the Philadelphia and Erie Railroad,.....*Williamsport, Pa.*
 JOSÉ N. CASANOVA, B. S.,*Cardenas, Cuba.*
 WALTER CRAFTS, C. E., Mining Engineer, St. Mary's Land Mineral Co., *Houghton, Mich.*
 ORMOND W. FOLLIN, B. S.,*Troy, N. Y.*
 ALBERT S. GREENE, C. E., Second Assistant Engineer in the U. S. Navy, Bureau of Engineering,.....*Washington, D. C.*
 GEORGE M. GREENE, C. E., Third Assistant Engineer in the U. S. Navy,.....*Steamer "Montauk."*
 THEODORE I. HEIZMANN, C. E., Principal Assistant Engineer on the Junction Railroad,.....*Philadelphia, Pa.*
 JAMES R. PERCY, C. E., Superintendent of the Union Schools,.....*Piketon, O.*
 HARRISON A. ROYCE, C. E., Regimental Quartermaster U. S. Infantry, (Volunteers,) —
 RUSSELL SAGE, 2d, C. E., Lieut. U. S. Infantry, (Volunteers,)
 ARTHUR B. DE SAULLES, B. S.,*New Orleans, La.*
 FRANK G. SMITH, C. E., 1st Lieut. 4th U. S. Artillery,
 ROBERT I. SLOAN, C. E.,
 LORENZO J. DE VISCARRONDO, C. E., Director of Public Roads, .. *St. John's, Porto Rico.*
 NORMAN A. WILLIAMS, C. E., Principal Assistant Engineer on the Utica and Waterville Railroad,.....*Utica, N. Y.*

CLASS OF 1860.

JAMES W. BIRDSALL, T. E.,*New York City.*
 ALBERTO DE CASTRO, T. E., Municipal Architect of Havana,.....*Havana, Cuba.*
 LEIZ DA R. DIAS, JR., T. E., Merchant,.....*Bahia, Brazil.*
 RICHARD D. DODGE, C. E., Second Assistant Engineer in the U. S. Navy, and Assistant Professor of Natural and Experimental Philosophy in the U. S. Naval Academy,.....*Newport, R. I.*
 EDWARD M. GRANT, C. E.,
 HENRIQUE HARRIS, T. E., C. E.,
 GEORGE C. HOLTON, C. E.,*Belleville, C. W.*
 RAMON MATAS, T. E., Civil Engineer,.....*Barcelona, Spain.*
 CHARLES McMILLAN, C. E., Assistant Engineer on the Croton Water Works,*New York City.*
 CALVIN PARDEE, B. S., Assistant Superintendent of Coal Mines,*Hazleton, Pa.*
 JOHN PEMBERTON, JR., C. E., Second Assistant Engineer in the U. S. Navy,.....*Steamer "Canandaigua."*
 WILLIAM H. SEARLES, C. E., Professor of Geodesy and Topographical Drawing in the Rensselaer Polytechnic Institute,*Troy, N. Y.*

AURELIO SERRANO, C. E., Assistant Engineer on the Public Works of Havana, and
Assistant Professor of Mathematics in Santa Barbara College, . . . *Havana, Cuba.*
*WILLIAM S. SIMPSON, B. S., _____
CHARLES E. SMITH, C. E., _____
FELIX R. R. SMITH, C. E., _____
CHARLES B. THOMPSON, B. S., _____
JOHN D. VAN BUREN, JR., C. E., Second Assistant Engineer in the U. S. Navy, and
Assistant Professor of Natural and Experimental Philosophy in the U. S. Naval
Academy, *Newport, R. I.*

CLASS OF 1861.

WILLIAM L. BALDWIN, C. E., M. D., Physician, *Geneva, N. Y.*
ALFRED P. BOLLER, A. M., C. E., Assistant Engineer on the Philadelphia and Erie
Railroad, *Williamsport, Pa.*
EBENEZER P. BUCKINGHAM, C. E., Sugar Refiner, *New York City.*
*JAMES CROMWELL, C. E., late Major U. S. Infantry, (Volunteers,) _____
RUFUS H. EMERSON, C. E., Merchant, *Erie, Pa.*
WILLIAM FENTON, C. E., Instructor in Mathematics and Geodesy in the Rensselaer
Polytechnic Institute, *Troy, N. Y.*
JOSEPH G. FOX, C. E., A. M., Principal of Collegiate and Engineering Institute, and
Professor of Mathematics in the Cooper Institute, *New York City.*
ESTÉVÁN A. FUERTES, C. E., Director of Public Roads, *St. John's, Porto Rico.*
BURDETT GOWING, C. E., Second Assistant Engineer in the U. S. Navy,
. *Steamer "Kennebec."*
WILLIAM L. HASKIN, C. E., 1st Lieut. 1st U. S. Artillery, *New Orleans, La.*
WARREN T. KELLOGG, C. E., Assistant Superintendent of a Manufactory,
. *Lansingburgh, N. Y.*
JAMES LALLY, C. E., Merchant, *New York City.*
ANTHONY T. E. MULLIN, C. E., Second Assistant Engineer in the U. S. Navy,
. *Steamer "Pocahontas."*
ROBERT NEILSON, C. E., Assistant Engineer on the Philadelphia and Erie Railroad,
. *Benzinger, Pa.*
T. GUILFORD SMITH, A. M., C. E., Resident Engineer on the Mahanoy and Broad Mt.
Railroad, *Ashland, Pa.*
THADDEUS S. SMITH, C. E., Chief Clerk in the U. S. Mustering and Disbursing Office,
. *St. Louis, Mo.*
MOSHER A. SUTHERLAND, C. E., Third Assistant Engineer in the U. S. Navy,
. *Steamer "Marblehead."*
WILLIAM N. SYMINGTON, C. E., _____

CLASS OF 1862.

WILLIAM L. ADAMS, C. E., _____ *Green Island, N. Y.*
WILLIAM S. AUCHINCLOSS, C. E., Jersey City Locomotive Works, . . . *Jersey City, N. J.*
NATHAN W. BUCKHOUT, C. E., Third Assistant Engineer in the U. S. Navy,
. *Steamer "Nantucket."*
RICHARD H. BUEL, C. E., Third Assistant Engineer in the U. S. Navy,
. *Steamer "Dacotah."*

HORACE CROSBY, C. E., Engineer in charge of the U. S. Government Fortifications, *Eastport, Me.*
 ARBA R. HADDOCK, C. E., Delamater's Iron Works, *New York City.*
 ANICETO G. DE MENOCAL, C. E., Assistant Engineer on the Public Works of Havana, *Havana, Cuba.*
 JOHN C. UNDERWOOD, C. E., _____
 PETER D. VROOM, JR., C. E., Major U. S. Cavalry, (Volunteers,) _____

CLASS OF 1863.

FRANCIS E. APPLETON, C. E., Engineer in charge of the U. S. Government Fortifications, *Belfast, Me.*
 VAN BRUNT BERGEN, C. E., Civil Engineer, *Bay Ridge, L. I.*
 PERCY T. BROWNE, C. E., Assistant Engineer on the Union Pacific Railroad, _____
 JAMES P. GOULD, C. E., Assistant Engineer on the City Railroads, *Albany, N. Y.*
 FRANK HINCKLEY, C. E., _____ *Cal.*
 FRANCISCO R. NARANJO, C. E., _____ *Coquimbo, Chile.*
 AUGUSTUS E. W. PAINTER, C. E., Assistant Superintendent of Iron Works,
 *Pittsburgh, Pa.*
 BENJAMIN C. POTTS, C. E., _____ *Trenton, N. J.*
 GEORGE T. STODDER, C. E., _____ *Brookline, Mass.*
 EDWIN THACHER, C. E., Assistant Engineer on the Cedar Rapids and Missouri River Railroad, *Cedar Rapids, Ia.*
 IGNACIO M. DE VARONA, C. E., _____ *Puerto Principe, Cuba.*
 FREDERIC W. VAUGHAN, C. E., Principal Assistant Engineer on the U. S. Military Railroads, *Nashville, Tenn.*